FINAL

RECORD OF DECISION
OPERABLE UNIT NO. 8
(SITE 16)

MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

CONTRACT TASK ORDER 0274

AUGUST 20, 1996

Prepared For:

DEPARTMENT OF THE NAVY
ATLANTIC DIVISION
NAVAL FACILITIES
ENGINEERING COMMAND
Norfolk, Virginia

Under:

LANTDIV CLEAN Program
Contract N62470-89-D-4814

Prepared by:

BAKER ENVIRONMENTAL, INC.
Coraopolis, Pennsylvania

OU 9

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4

345 COURTLAND STREET N.E.
ATLANTA, GEORGIA 30365

AUG 3 2 1990

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

4WD-FFB

Commanding General
Building 1
Marine Corps Base
Camp Lejeune, North Carolina 28542

Subj: Record of Decision
Operable Unit 8, Site 16
MCB Camp Lejeune NPL Site
Jacksonville, North Carolina

Dear Sir:

The U.S. Environmental Protection Agency (EPA) Region 4 has reviewed the above subject decision document and concurs with the selected remedy for the Remedial Action at Site 16. This remedy is supported by the previously completed Remedial Investigation and Baseline Risk Assessment Reports.

The selected remedial alternative is no further action. This involves taking no further remedial actions at the site and leaving the environmental media as they currently exist. This remedial action is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action and is cost effective.

Sincerely,

John H. Hankinson, Jr.
Regional Administrator

cc: Elsie Munsell, Deputy Assistant Secretary of the Navy
Neal Paul, Camp Lejeune
Kate Landman, LANTDIV
Patrick Watters, NCDEHNR

UNITED STATES MARINE CORPS
MARINE CORPS BASE
PSC BOX 20004
CAMP LEJEUNE, NORTH CAROLINA 28542-0004

IN REPLY REFER TO
6286
BEMD

30 OCT 1996

Ms. Gena Townsend
United States Environmental Protection
Agency, Region IV
Waste Management Division
345 Courtland Street
Atlanta, Georgia 30365

Dear Ms. Townsend:

On September 30, 1996, Major General P.G. Howard, Commanding General, Marine Corps Base, Camp Lejeune signed the Record of Decision (ROD) for Operable Unit No. 8 (Site 16).

This ROD is enclosed for your records. We appreciate your agency's concurrence and will ensure that the land use restrictions specified in the ROD are included in the Base Master Plan.

If you have any questions or comments, please contact Mr. Neal Paul, Director, Installation Restoration Division, Environmental Management Department, at telephone (910) 451-5068.

Sincerely,

SCOTT A. BREWER, PE
Deputy Assistant Chief of Staff
Environmental Management
By direction of
the Commanding General

Encl:
(1) Record of Decision for Operable Unit No. 8

Copy to:
CMC (LFL, K. Dreyer)
ATSDR (C. Hossum)

Copy to: (w/o encl)
COMLANTNAVFACENGCOM (Code 1823, K. Landman)

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

LIST OF ACRONYMS AND ABBREVIATIONS

AWQC	Ambient Water Quality Criteria
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLEAN	Comprehensive Long-Term Environmental Action Navy
COPCs	contaminants of potential concern
DDD	dichlorodiphenyldichloroethane
DDE	dichlorodiphenyldichloroethylene
DDT	dichlorodiphenyltrichloroethane
DoN	Department of the Navy
FFA	Federal Facilities Agreement
HI	hazard index
HQ	hazard quotient
ICR	incremental cancer risk
IRP	Installation Restoration Program
LANTDIV	Naval Facilities Engineering Command, Atlantic Division
mg/kg	milligrams per kilogram
MCB	Marine Corps Base
MCL	Maximum Contaminant Level
NC DEHNR	North Carolina Department of Environment, Health and Natural Resources
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NCWQS	North Carolina Water Quality Standard
NOAA ER-L	National Oceanic Atmospheric Administration Effective Range-Low
NPL	National Priorities List
OU	Operable Unit
PCBs	polychlorinated biphenyls
ppm	parts per million
PRAP	Proposed Remedial Action Plan
RAs	risk assessments
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SSV	sediment screening value
SSSVs	surface soil screening values
SVOCs	semivolatile organic compounds
SWSV	surface water screening value

LIST OF ACRONYMS AND ABBREVIATIONS
(Continued)

TAL	target analyte list
TCL	target compound list
µg/kg	microgram per kilogram
µg/L	microgram per liter
USEPA	United States Environmental Protection Agency
U.S.	United States
VOC	volatile organic compound

DECLARATION

Site Name and Location

Operable Unit No. 8
Site 16
Marine Corps Base
Camp Lejeune, North Carolina

Statement of Basis and Purpose

This decision document presents the selected remedy for Operable Unit (OU) No. 8 (Site 16), at Marine Corps Base (MCB) Camp Lejeune, North Carolina. The selected remedy for OU No. 8 was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA), and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the Administrative Record for OU No. 8.

Description of the Selected Remedy

The selected remedial alternative for OU No. 8 is no further action. Following land use restrictions being implemented by MCB, Camp Lejeune, this remedial alternative involves taking no further remedial actions (including long term monitoring), at the site and leaving the environmental media as they currently exist. However, should potential hazards posed by conditions at the site occur in the future, monitoring to verify that no unacceptable exposures have occurred may be authorized. The land use restrictions being implemented, via the Base Master Plan, are to preclude the development of this site for residential purposes and to prohibit the installation of supply water wells within 1,000 feet of this site.

The no further remedial action decision is justifiable, as the conditions at OU No. 8 are protective of human health and the environment, and no additional remedial action is necessary to ensure this protection.

P. K. Howard

Signature (Commanding General, MCB Camp Lejeune)

30 SEP 1996

Date

DECISION SUMMARY

1.0 INTRODUCTION

This Record of Decision (ROD) document presents the final remedial action plan selected for Operable Unit (OU) No. 8 (Site 16) at Marine Corps Base (MCB), Camp Lejeune, North Carolina. The environmental media at this site were investigated as part of a Remedial Investigation (RI). Based on the results of the RI preferred remedial action alternatives were identified in a Proposed Remedial Action Plan (PRAP) document. Then, the public was given the opportunity to comment on the RI and PRAP. Based on comments received during the public comment period, and any new information that became available in the interim, a final remedial action plan was selected for OU No. 8 (Site 16). This ROD document presents the final selected remedy along with a summary of the remedy selection process.

The ROD is organized into 9 main sections. Section 1.0 presents an introduction, and Section 2.0 presents the site name and location, and a brief description of the site layout. Section 3.0 presents a history of the site and previous investigations/enforcement activities conducted there. Section 4.0 highlights community participation events that have occurred during the development of this ROD. Section 5.0 describes the scope and role of the response action developed to address the site contamination, and Section 6.0 summarizes the nature and extent of this site contamination (i.e., the site characteristics). Section 7.0 summarizes the site risks as determined by human health and ecological risk assessments. Section 8.0 provides the final remedy selected. Finally, Section 9.0 provides the responsiveness summary which contains a summary of comments received during the public comment period.

2.0 SITE NAME, LOCATION AND DESCRIPTION

MCB Camp Lejeune is a training base for the United States (U.S.) Marine Corps located in Onslow County, North Carolina. MCB Camp Lejeune is located approximately 45 miles south of New Bern and 47 miles north of Wilmington, North Carolina. The facility covers approximately 236 square miles and includes 14 miles of coastline. The military reservation is bisected by the New River, which flows in a southeasterly direction and forms a large estuary before entering the Atlantic Ocean. The eastern border of MCB Camp Lejeune is the Atlantic shoreline; while U.S. Route 17 and State Route 24 border the western and northwestern boundaries of MCB Camp Lejeune, respectively. The City of Jacksonville, North Carolina, borders the facility to the north.

OUs are formed as an incremental step toward addressing individual site concerns and to simplify specific problems associated with a site or a group of sites. Currently, there are 41 Installation Restoration Program (IRP) sites at MCB Camp Lejeune. These 41 IRP sites have been grouped into 17 OUs, with OU No. 8 being one of the 17 OUs within MCB Camp Lejeune. Site 16 is the only site within OU No. 8. Figure 1 is a location map of OU No. 8 in relation to MCB Camp Lejeune.

Site 16, the Montford Point Burn Dump, is located southwest of Montford Landing Road and Wilson Drive intersection within the Montford Point development area of Camp Johnson. Site 16 is approximately 4 acres in size. Northeast Creek is located approximately 400 feet southeast of the study area and flows in the southwesterly direction towards/into the New River. Figure 2 depicts the topography and general site features of Site 16.

As shown on Figure 2, most of Site 16 is cleared; however, the area which surrounds Site 16 is comprised of pine and hardwood forest. An opening in the southeast corner of the study area leads to Northeast Creek.

3.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

Limited information is available concerning the past operational history of the burn dump; however, Site 16 was opened about 1958 and was closed in 1972. Practices at other burn dumps at MCB Camp Lejeune indicate that the Montford Point Burn Dump may have accepted municipal waste or trash from the surrounding housing area and activity buildings. Records indicate that waste oils were also disposed at Site 16. Typically, the debris was burned and then graded to the perimeter of the disposal area so that more debris could be dumped and burned. Asbestos material that was once dumped on the surface has been removed.

Recently, Site 16 has been used for vehicle staging and for vehicle training exercises. A mock-up jet aircraft is located in the center of the study area. This aircraft is used in refueling exercises by tank truck operators. During these exercises, however, no fuel is used. A four-foot wide ditch, believed to be a fire break, is present in the southwest portion of the study area. This ditch extends around the western side of the former burn dump. There are no permanent structures at Site 16.

MCB Camp Lejeune was placed on the CERCLA National Priorities List (NPL) effective October 4, 1989 (54 Federal Register 41015; October 4, 1989). The United States Environmental Protection Agency (USEPA) Region IV, the North Carolina Department of Environment, Health and Natural Resources (NC DEHNR) and Department of the Navy (DoN) entered into a Federal Facilities Agreement (FFA) for MCB Camp Lejeune. The primary purpose of the FFA was to ensure that environmental impacts associated with past and present activities at the Base were thoroughly investigated and appropriate CERCLA response/Resource Conservation and Recovery Act (RCRA) corrective action alternatives were developed and implemented, as necessary, to protect the public health and environment.

No investigations were conducted at Site 16 prior to the Remedial Investigation (RI) Report. Therefore, the remainder of this section discusses the RI Report exclusively.

The field program for the RI Report for Site 16, conducted in mid 1994 to early 1995, consisted of a site survey, and sampling of the surface soil, subsurface soil, groundwater, surface water and sediment. The sampling locations associated with these various media are identified on Figure 3.

The site survey task consisted of an initial survey of site features and a post investigation survey of the sampling locations and monitoring wells.

Thirty-two surface soil samples (collected from 0 to 1 foot below ground surface [bgs]) and thirty-five subsurface soil samples (collected from 1 foot bgs to just above the groundwater table) were collected and analyzed for full Target Compound List (TCL) organics and Target Analyte List (TAL) inorganics. In order to identify the types of material which may have been disposed of at Site 16, four test pits were excavated as part of the subsurface soil investigation. Samples were not collected from the test pits due to their close proximity to the soil borings, the lack of encountering waste material, and that no elevated photoionization detector readings were detected which would indicate potential contamination.

Six shallow groundwater monitoring wells were installed to determine the presence or absence of contamination in the surficial aquifer which may have resulted from past burning and disposal activities. Groundwater was sampled using USEPA Region IV's low flow purging and sampling techniques during all sampling rounds. The first round of groundwater sampling was conducted in November/December 1994. Groundwater samples were analyzed for full TCL organics and TAL total (unfiltered) and dissolved (filtered) metals. In early February of 1995, a second round of groundwater samples was collected and analyzed for full TCL organics and TAL total metals. At the request of NC DEHNR representatives a third groundwater sample was collected from monitoring well 16-MW05 in March 1996 and analyzed for TCL volatile organics only.

Five surface water samples and ten sediment samples (collected from 0 to 6 inches and 6 to 12 inches) were collected along Northeast Creek. Each of the surface water and sediment samples were analyzed for full TCL organics and TAL inorganics. In addition, the sediment samples collected at the 0 to 6 inch sampling interval were also analyzed for total organic carbon and grain size.

In response to a comment from the NC DEHNR four additional surface soil samples were collected within a 10-foot radius of the detected elevated lead sample previously collected from location SB05. The four additional samples were collected from 0 to 1 foot bgs. and were analyzed for TAL total metals. the lead results for these four additional surface soil sample were all well within the Base Background results, and ranged from 9.5 mg/kg to 20.5 mg/kg.

4.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

The Final RI Report and Final Proposed Remedial Action Plan (PRAP) for OU No. 8 at MCB Camp Lejeune, North Carolina were released to the public on March 7, 1996. These documents were made available to the public at the information repositories maintained a the Onslow County Public Library and the MCB Camp Lejeune library. The notice of availability of these documents was published in the Jacksonville Daily News, on February 25, 1996.

A public comment period regarding OU No. 8 was held from March 7, 1996 through April 1, 1996, and a public meeting regarding the same was held on March 7, 1996. During this public meeting, representatives from the DoN and the Marine Corps discussed the preferred remedial action under consideration. Community concerns were also addressed during this public meeting.

Community comments regarding the preferred remedial action, and the response to the comments received during the noted comment period are included in the Responsiveness Summary section of this Record of Decision (ROD).

5.0 SCOPE AND ROLE OF RESPONSE ACTION

No further action is the selected remedial action for OU No. 8. The no further action decision is the final recommended action for OU No. 8. This decision is based on the findings of the RI field investigation, along with the results of the baseline human health and ecological risk assessments (RAs).

Justification for this decision is presented within the following sections of this ROD.

6.0 SITE CHARACTERISTICS

A brief summary of the nature and extent of contamination at Site 16 is provided below. This summary focuses on the primary problems at the site.

6.1 Soils

The pesticides 4,4' dichlorodiphenyldichloroethane (DDD), 4,4'-dichlorodiphenyldichloroethylene (DDE), 4,4'-dichlorodiphenyltrichloroethane (DDT), alpha-chlordane, and dieldrin are the most prevalent contaminants detected in the surface soil. 4,4'-DDE was detected in 26 of the 29 surface soil samples. The maximum pesticide concentration reported is for 4,4'-DDT at 540 micrograms per kilogram (µg/kg). Pesticide contamination is at relatively consistent concentration levels in the surface soil samples collected across Site 16. Pesticide contamination in the subsurface soil is less frequent than in the surface. The most prevalent pesticide, 4,4'-DDE, was detected in only 3 of 32 samples. The pesticide levels detected in the surface and subsurface soil at Site 16 are similar to levels detected at other areas within MCB Camp Lejeune. Due to the fact that most of the pesticide contamination is present in surface soils, and that the contaminant concentrations are comparable to pesticide levels throughout the Base, it is believed that the pesticides in soil are due to Base-wide pest control activities that were prevalent in the 1970's and not concentrated dumping or disposal practices.

Surface soil contamination also consists of polychlorinated biphenyls (PCBs), Aroclor 1254 and Aroclor 1260. Aroclor 1254 is the most prevalent being detected in 13 of 29 surface soil samples. Additionally, the maximum contaminant level (2,100 µg/kg) is reported for Aroclor 1254. Aroclor 1254 is present in 2 of 32 subsurface locations. The detections of Aroclor 1254 and 1260 are from sampling locations across Site 16. PCBs are not found in the groundwater indicating that vertical migration to the water table has not occurred.

Semivolatile compounds are infrequently encountered at low levels in the surface soil. Other than bis(2-Ethylhexyl)phthalate, which is believed to be due to laboratory contamination, the most frequent semivolatile compound detected is chrysene (4 out of 29 samples). All of the semivolatile compounds concentrations are less than 130 µg/kg, which are relatively low. Subsurface soil is relatively absent of semivolatile contamination. Acenaphthene and pentachlorophenol (3 out of 32 samples) are the most prevalent semivolatiles in the subsurface soil. The concentration levels and presence of semivolatile compounds in the soil is random across Site 16. The source of the semivolatile compounds is believed to be due to historical open burning operations.

Other than common lab contaminants (e.g., methylene chloride, acetone, and toluene) volatile organic contamination is absent in the surface and subsurface soil.

The concentrations of several inorganic constituents exceed twice the average Base-specific background concentration. Comparing the results for surface and subsurface soil, it appears that there is little correlation between elevated metals concentrations in the surface and subsurface soil. For surface soils, arsenic, barium, cadmium, chromium, copper, iron, lead, mercury, selenium, vanadium, and zinc were the predominant metals that exceed Base background levels more than once. In contrast, zinc is the only metal that exceeds Base background levels more than one time in the subsurface soil.

6.2 Groundwater

Two rounds or groundwater samples were collected from six shallow wells at Site 16. Additionally, a third groundwater sample was collected shallow monitoring well 16-MW05.

Volatile contaminants benzene and ethylbenzene were detected in one groundwater sample collected during the first round of groundwater sampling. Benzene and ethylbenzene were detected at levels of 37 micrograms per liter (µg/L) and 1 µg/L, respectively. Volatile contaminants were absent in all second round groundwater samples collected. Volatile organics were absent in the third groundwater sample collected from well 16-MW05.

Metals were the most prevalent and widely distributed contaminants in the groundwater. Elevated levels of total (unfiltered) metals during these sampling rounds included barium (maximum concentration 77.9 µg/L), iron (maximum concentration 712 µg/L), lead (maximum concentration 3.2 µg/L), manganese (maximum concentration 31.6 µg/L), and zinc (maximum concentration 80.5 µg/L). Iron is the only metal contaminant which exceeds State drinking water standards. Iron was detected above the State standard in one well. It is questionable; however, whether the iron is due to disposal operations, since elevated levels of iron are common in shallow groundwater throughout the Base and region.

Semivolatile contamination in the groundwater was limited to low levels of naphthalene (maximum concentration 6 µg/L), bis(2-Ethylhexyl)phthalate (maximum concentration 5 µg/L), and phenol (maximum concentration 4 µg/L).

Pesticide and PCB contaminants were not detected in either round of sampling.

6.3 Surface Water/Sediment

Northeast Creek is the only surface water body in the vicinity of Site 16. One surface water and two sediment samples were collected from each of five sampling stations along Northeast Creek.

Volatile contaminants 1,1,2,2-Tetrachloroethane and 4-Methyl-2-pentanone were detected in one surface water sample at a concentration of 2 µg/L and 7 µg/L, respectively. No other volatile organics were detected in the surface water. Only 1,1,2,2-Tetrachloroethane exceeded its Ambient Water Quality Criteria (AWQC); however, this sample location is approximately a quarter mile downstream of OU No. 8 and therefore may not be directly site-related.

Semivolatile, pesticide, and PCB contaminants were not detected in the surface water. The occurrence of bis(2-Ethylhexyl)phthalate is a common laboratory contaminant that can be attributed to laboratory analysis of the samples.

Arsenic was detected in 4 out of 5 surface water samples. All of the arsenic detections where slightly above the AWQC, and although detected in surface and subsurface soils as well, did not trigger a human health risk for any of the media. Manganese was detected in 5 out of 5 surface water samples. All of the manganese detections were above the AWQC; however, these detections did not trigger a human health risk.

Volatile organics, carbon disulfide (1 out of 10 samples) and toluene (2 out of 10 samples) were detected in the sediment at concentrations of 2 µg/kg for each contaminant.

Semivolatile, pesticide, and PCB contamination is absent in the sediment.

Silver was detected in 1 out of 10 samples at a concentration of 1.2 milligrams per kilogram (mg/kg), slightly above the National Oceanic Atmospheric Administration Effects Range-Low (NOAA ER-L).

Table 1 presents a summary of the site contamination identified in the surface soil, subsurface soil, groundwater (rounds 1 and 2), surface water and sediment.

7.0 SUMMARY OF SITE RISKS

As part of the RI Report, a baseline human health RA and an ecological RA were conducted to evaluate the potential risks associated with exposure to the environmental media at Site 16. The baseline human health RA considered the most likely routes of potential exposure for both current and future risk scenarios. The key findings of each RA are summarized below.

7.1 Baseline Human Health Risk Assessment

Five environmental media were investigated during the RI including surface soil, subsurface soil, groundwater, surface water and sediment. Contaminants of potential concern (COPCs), which are site related contaminants used to quantitatively estimate human exposures and associated health effects, were selected for each of the environmental medium. Table 2 presents the selected COPCs based on the human health RA. In addition, Table 2 presents a comparison of contaminant levels to relevant criteria/standards.

As part of the baseline human health RA, a conceptual site model was developed to encompass current and future routes for potential exposure at Site 16. The potential receptors evaluated included current military personnel, future on-site residents (adults and children), and future construction workers. Figure 4 presents the Site 16 conceptual model, highlighting potential contaminant sources, migration pathways and potential receptors.

As part of the baseline human health RA, incremental cancer risk (ICR) values and hazard index (HI) values were calculated for each of the exposure routes and potential receptors. ICR refers to the cancer risk that is over and above the background cancer risk in unexposed individuals. ICRs are determined by multiplying the contaminant intake level (i.e., or dose), with the cancer potency factor. The calculated risks are probabilities which are typically expressed in scientific notation (i.e., 1E-04). For example, an ICR of 1E-04 means that one additional person out of ten thousand may be at risk of developing cancer due to excessive exposure at a site if no actions are conducted. The USEPA acceptable target risk range is 1E-04 to 1E-06 (i.e., one in ten thousand to one in one million). Potential concern for noncarcinogenic effects of a single contaminant in a single medium is expressed as a hazard quotient (HQ). By adding the HQs for all contaminants within a medium or across all media to which a given population may reasonably be exposed, the HI can be generated. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media. The HI refers to noncarcinogenic effects and is a ratio for the level of exposure to an acceptable level for all contaminants of potential concern. An HI greater than or equal to unity (i.e., 1.0) indicates that there may be a concern for noncarcinogenic health effects.

Table 3 presents individual media ICRs and HIs, as well as the calculated total site ICRs and HIs. As shown on Table 3, all of the media/potential receptors evaluated had ICRs within the USEPA's acceptable target risk range of 1E-4 to 1E-6. Therefore, the potential receptors are not at adverse risk from carcinogens which are present in the soil, groundwater, surface water and/or sediment. All of the individual medium and potential receptors evaluated had HIs less than 1.0. The total HI value for future residential children; however, had a total HI equal to 1.19. This total HI value indicates that adverse noncarcinogenic health effects may occur upon prolonged exposure. Exposure to soil, via incidental ingestion in particular, drives the total noncarcinogenic risk for future residential children. Ninety-six percent of this risk was generated by the presence of Aroclor 1254, arsenic, aluminum, mercury, cadmium, and chromium. The remaining four percent of the risk was generated by the contaminants dieldrin, beryllium, copper, and zinc. Aroclor 1254, a PCB, in surface soil contributed 52 percent of the risk associated with soil ingestion by future residential children. The exposure scenario involving children is conservative; it assumes that the site would be developed into a residential area, and no land disturbance such as grading would result.

7.2 Ecological Risk Assessment

An ecological RA was conducted to evaluate if past disposal practices potentially impact the ecological integrity of aquatic and terrestrial communities on or adjacent to the site. The ecological RA identified surface water, sediment and surface soil as the media of concern. The ecological COPCs are presented on Table 4.

Overall, four inorganics (aluminum, barium, iron, and lead), along with the volatile organic compound (VOC), 4-Methyl-2-pentanone, were the only ecological COPCs retained for the surface water aquatic receptors. The ecological COPCs for the surface water terrestrial receptors included all of the noted aquatic COPCs, and the contaminants vanadium and 1,1,2,2-Tetrachloroethane.

No semivolatile organic compounds (SVOCs), pesticides or PCBs were detected in any of the sediment samples. Carbon disulfide, silver, and vanadium were retained as ecological COPCs for sediment. Inorganics, pesticides, PCBs, and SVOCs appear to be the most significant COPCs retained for surface soil.

Manganese was the only COPC in the surface water that exceeded a surface water screening value (SWSV), while silver was the only COPC in the sediment that exceeded a sediment screening value (SSV). Overall, a slight potential adverse impact to aquatic receptors is expected from manganese (in the surface water) and silver (in the sediment). However, these contaminants do not appear to be site-related since there is no correlation between the sample concentration and the proximity of the samples to the site. For example, manganese was detected above its SWSV at similar levels approximately one quarter of a mile upstream, adjacent to the site, as well as one quarter of a mile downstream of the site. Silver was only detected at one sampling location approximately one quarter of a mile upstream of the site.

Several COPCs in the surface soil exceeded their respective surface soil screening values (SSSVs). Most of the surface soil samples were collected in areas that are non-vegetated and/or gravel covered. There are also some exceedances of the SSSVs in the wooded areas surrounding the open area; therefore, there is the potential for adverse impacts to terrestrial flora and fauna in these areas as well. No areas of dead or stressed vegetation were visually observed during either the field investigations or the habitat characterization. Although COPCs in these areas do exceed SSSVs, the exceedences are not expected to be ecologically significant to the terrestrial floral or faunal

population due to the current use of the land, most of which is not conducive to habitats of the modeled ecological receptors.

There is a slight potential risk to the cottontail rabbit from site contaminants. The rabbit's diet is 100 percent vegetation. Since most of the site is unvegetated (as it is used for vehicle storage and training), the rabbit will not ingest vegetation within most of Site 16. Considering this aspect, the risk to the rabbit is overestimated and therefore, does not appear to be a significant risk from site-related COPCs.

The majority of the risk to the raccoon was due to aluminum in the surface water. Since the aluminum is not site-related, there does not appear to be a significant risk to the raccoon from site-related COPCs.

No threatened or endangered species are known to reside at or near Site 16; therefore, no adverse impacts to these species are expected. Likewise, there are no wetlands which would provide a habitat to a variety of plant and animal species.

In summary, a potential decrease in the aquatic receptor population from site-related COPCs is not expected. Similarly, a potential decrease in the terrestrial vertebrate receptor population from site-related COPCs is not expected.

8.0 DESCRIPTION OF THE "NO ACTION" ALTERNATIVE

As noted previously, the selected remedial alternative for OU No. 8 is no further action. Although the total scenario HI for residential child exposure to soil is slightly greater than 1.0, no HQ from a single chemical exceeds 1.0. However, since the human health RA indicated that PCBs are the main contributor to potential noncarcinogenic risks under the future residential child scenario, an evaluation was conducted to determine if remediation of PCB-soil is feasible.

The PCB concentrations were evaluated against the USEPA guidance for the cleanup of PCBs under CERCLA. Aroclor 1254 was detected in 13 of the 29 surface soil samples at concentrations ranging from 41 µg/kg, or 0.041 parts per million (ppm), to 2,100 µg/kg, or 2.1 ppm. Based on EPA Publication PB91-921206 entitled Guidance on Remedial Actions for Superfund Sites with PCB Contamination, concentrations of 0.1 ppm to 10 ppm will generally fall within the protective range (10^{-4} to 10^{-6}), with respect to residential land use. Since the detected concentrations of PCBs at OU No. 8 did not present an unacceptable current or future carcinogenic human health risk, and since the maximum detected concentration (i.e., 2.1 ppm) is within the suggested remediation range for residential land use (i.e., 1 to 10 ppm), remediation of the PCB-soil is not warranted for the protection of human health.

Although the HI for residential children will remain above 1.0, the Camp Lejeune Master Plan is being changed to preclude the development of this site for residential purposes and to prohibit the installation of water supply wells within 1,000 feet of the site.

In conclusion, no human health risks were identified under the current land use exposure scenarios and no areas of concern were identified at OU No. 8. Therefore, no further action is deemed appropriate. This alternative involves taking no further remedial actions (including long-term monitoring), at the site and leaving the environmental media as they currently exist. This remedial alternative will have no cost associated with it.

9.0 RESPONSIVENESS SUMMARY

The selected remedy for OU. No. 8 is no further action.

Based on comments received during the public comment period and the lack of attendance at the March 7, 1996 public meeting, the public appears to support the preferred alternative. In addition, the USEPA Region IV and NC DEHNR are in support of the selected remedy outlined herein for OU No. 8.

9.1 Background on Community Involvement

A record review of the MCB, Camp Lejeune files indicate that the community involvement centers mainly on a social nature, including the community outreach programs and base/community clubs. The file search did not locate written Installation Restoration Program (IRP) concerns of the community. A review of historic newspaper articles indicated that the community is interested in the local drinking and groundwater quality, as well as that of the New River, but that there are no expressed interests or concerns specific to the environmental sites (including Site 16). Two local environmental groups, the Stump Sound Environmental Advocates and the Southeastern Watermen's Association, have posed questions to the Base and local officials in the past regarding other environmental issues. These groups were sought as interview participants prior to the development of the Camp Lejeune, IRP, Community Relations Plan. Neither group was available for the interviews.

Community relations activities to date are summarized below:

- Prepared a Community Relations Plan, September, 1990.
- Conducted additional community relations interviews, August 1993. Nineteen persons were interviewed, representing local business, civic groups, on- and off-Base residents, military and civilian interests.
- Prepared a Final Community Relations Plan, February, 1994.
- Established two information repositories.
- Established the Administration Record for all of the sites at the Base.
- Released the PRAP for OU No. 8 for public review in the repositories, March 7, 1996.
- Released public notice announcing public comment and document availability of the PRAP on February 25, 1996.
- Held a Technical Review Committee meeting on March 7, 1996 to review the PRAP and solicit comments.
- Held a public meeting on March 7, 1996, to solicit comments and provide information. There was no public participation at the meeting.

9.2 Comments Received During the Public Comment Period and Agency Response

A public meeting was held on March 7, 1996 in the Onslow County Library in Jacksonville, North Carolina. Representatives from LANTDIV, MCB, Camp Lejeune, USEPA Region IV, NC DEHNR, and OHM Corporation attended the meeting. There was no participation from the community at this meeting. The transcript for the public meeting is provided in Appendix A. Comments provided by NC DEHNR are summarized as follows. No comments were received from the public.

NC DEHNR requested a third groundwater sample be collected from monitoring well 16-MW05. Due to the inconclusive data from the initial two rounds, this sample was analyzed for TCL volatile organics. The results of this analysis confirmed the absence of benzene, which was detected in the initial round but absent in the second round of sampling. The response to this was to collect the additional sample and present the findings in this document.

NC DEHNR requested that soil screening levels, which are protective of groundwater, be developed for the contaminants detected in the subsurface soil at Site 16. The response to this is that the levels will be taken from USEPA Region III's Risk-Based concentration Table published October 4, 1995. The values in this table are felt to be the most conservative and are acceptable to state and federal regulators. These values appear in Table 1 of this document.

TABLES

TABLE 1

SUMMARY OF SITE CONTAMINATION
OPERABLE UNIT NO. 8 (SITE 16)
RECORD OF DECISION, CTO-0274
MCB, CAMP LEJEUNE, NORTH CAROLINA

Media	Fraction	Contaminant	Comparison Criteria	Comparison Criteria	Site Contamination					
					Min.	Max.	Detection Frequency	No. of Detections Above Comparison Criteria	No. of Dectections Above Comparison Criteria	Locaion/Distribution Around Site 16
					(µg/kg)	(µg/kg)				
Surface Soil	Volatile Organic Compounds	Methylene chloride	NE	NE	6J	15J	3/29	NA	NA	--
		Acetone	NE	NE	11J	1200	3/29	NA	NA	--
		Toluene	NE	NE	1J	4J	3/29	NA	NA	Central
	Semivolatile Organic Compounds	Phenol	NE	NE	70J	70J	1/29	NA	NA	Western
		1,4 Dichlorobenzene	NE	NE	43J	43J	1/29	NA	NA	Surface Drainage Area
		Naphthalene	NE	NE	36J	36J	1/29	NA	NA	Southern
		2-Methylnaphthalene	NE	NE	67J	67J	1/29	NA	NA	Southern
		Phenanthrene	NE	NE	52J	99J	3/29	NA	NA	Western/Southwestern
		Anthracene	NE	NE	100NJ	100NJ	1/29	NA	NA	Southern
		Fluoranthene	NE	NE	46J	46J	1/29	NA	NA	Surface Drainage Area
		Pyrene	NE	NE	39J	110J	3/29	NA	NA	Scattered
		Butyl Benzyl phthalate	NE	NE	64J	64J	1/29	NA	NA	Southern
		Benzo(a)anthracene	NE	NE	43J	43J	1/29	NA	NA	Western
		Chrysene	NE	NE	43J	70J	4/29	NA	NA	Southern
		bis(2-Ethylhexyl)phthalate	NE	NE	37J	49	6/29	NA	NA	Scattered
		Benzo (b)fluoranthene	NE	NE	54J	88J	2/29	NA	NA	Scattered
		Benzo (k) fluoranthene	NE	NE	84J	84J	1/29	NA	NA	Surface Drainage Area
		Benzo (a) pyrene	NE	NE	42J	130J	2/29	NA	NA	Scattered
		Indeno (1,2,3-cd) pyrene	NE	NE	52J	52J	1/29	NA	NA	Southern
		Benzo (g,h,i) perylene	NE	NE	92J	92J	1/29	NA	NA	Southern

TABLE 1 (Continued)

SUMMARY OF SITE CONTAMINATION
OPERABLE UNIT NO. 8 (SITE 16)
RECORD OF DECISION, CTO-0274
MCB, CAMP LEJEUNE, NORTH CAROLINA

Media	Fraction	Contaminant	Comparison Criteria	Comparison Criteria	Site Contamination					
					Min.	Max.	Detection Frequency	No. of Detections Above Comparison Criteria	No. of Dectections Above Comparison Criteria	Locaion/Distribution Around Site 16
Surface Soil (Cont.)	Pesticides/ PCBs				(µg/kg)	(µg/kg)				
		delta-BHC	NE	NE	4.7	4.7	1/29	NA	NA	Surface Drainage Area
		Aldrin	NE	NE	3.4J	3.4J	1/29	NA	NA	Western
		Dieldrin	NE	NE	5.6	77J	10/29	NA	NA	Scattered
		4,4'-DDE	NE	NE	5	440	26/29	NA	NA	Scattered
		Endrin	NE	NE	6.5	14J	3/29	NA	NA	Southwestern
		Endosulfan II	NE	NE	1.9J	26J	8/29	NA	NA	Scattered
		4,4'-DDD	NE	NE	2.6J	120	20/29	NA	NA	Widespread
		Endosulfan Sulfate	NE	NE	4.8J	4.8J	1/29	NA	NA	Northern
		4,4'-DDT	NE	NE	3.8	540J	24/29	NA	NA	Widespread
		Methoxychlor	NE	NE	4.6J	4.6J	1/29	NA	NA	Western
		Endrin ketone	NE	NE	4.2	9.9	2/29	NA	NA	Western
		Endrin aldehyde	NE	NE	4.6	29	9/29	NA	NA	Scattered
		alpha-Chlordane	NE	NE	3.1J	120	11/29	NA	NA	Scattered
		gamma-Chlordane	NE	NE	1.6J	72J	9/29	NA	NA	Scattered
		Aroclor-1254	NE	NE	41	2,100	13/29	NA	NA	Scattered
		Aroclor-1260	NE	NE	50J	210J	2/29	NA	NA	Scattered

TABLE 1 (Continued)

SUMMARY OF SITE CONTAMINATION
OPERABLE UNIT NO. 8 (SITE 16)
RECORD OF DECISION, CTO-0274
MCB, CAMP LEJEUNE, NORTH CAROLINA

Media	Fraction	Contaminant	Comparison Criteria	Comparison Criteria	Site Contamination					
					Min.	Max.	Detection Frequency	No. of Detections Above Comparison Criteria	No. of Dectections Above Comparison Criteria	Locaion/Distribution Around Site 16
Surface Soil (Cont.)				Base Background (mg/kg)	(mg/kg)	(mg/kg)			Base Background	
	Inorganics	Aluminum	NA	17.7 - 9,570	866J	18,500J	29/29	NA	1[a]	North/northwest
		Arsenic	NA	0.065 - 3.9	2.3	24.7J	17/29	NA	11	Scattered
		Barium	NA	0.65 - 20.8	3	334	29/29	NA	9	Scattered
		Beryllium	NA	0.02 - 0.26	0.24	0.49	6/29	NA	2	Western
		Cadmium	NA	0.04 - 0.6	1.8	9.6	2/29	NA	2	Scattered
		Calcium	NA	4.25 - 10,700	66.4J	112,000J	25/29	NA	6	Scattered
		Chromium	NA	0.33 - 12.5	2.2	43.2J	27/29	NA	3	Scattered
		Cobalt	NA	0.185 - 2.355	6.3	6.3	1/29	NA	1	Northwest
		Copper	NA	0.5 - 87.2	2.2J	543J	24/29	NA	2	Scattered
		Iron	NA	69.7 - 9,640	470	69,700	24/29	NA	5	Scattered
		Lead	NA	0.47 - 142	3.8J	5,210J	28/29	NA	2	Central to Northwest
		Magnesium	NA	2.55 - 610	32.5	2,520	23/29	NA	1	Northwest
		Manganese	NA	0.87 - 66	2.8J	1,030J	25/29	NA	1	Scattered
		Mercury	NA	0.01 - 0.08	0.11J	14	9/29	NA	9	Scattered
		Nickel	NA	0.6 - 3.55	24.4	24.4	1/29	NA	1	Northwest
		Potassium	NA	1 - 416	205	475	10/29	NA	1	Central
		Selenium	NA	0.075 - 1.3	1.1	6	8/29	NA	4	Scattered
		Silver	NA	0.0435 - 4.3	1.2	3.1	2/29	NA	0	--
		Sodium	NA	4.7 - 126	26.8	63.4	11/29	NA	0	--
		Thallium	NA	--	2.1	3.6	2/29	NA	--	--
		Vanadium	NA	0.305 - 18.2	2.3J	45.4	28/29	NA	2	Scattered
		Zinc	NA	0.3 - 28.3	14.2J	4,350J	17/29	NA	13	Scattered

PROCEEDINGS 7:17 P.M.

MR. BARTMAN: I GUESS INFORMALLY WHAT WE'LL DO SINCE WE DON'T HAVE A TRUE PUBLIC HERE, AND MOST OF THESE PEOPLE HAVE SEEN THESE SLIDES BEFORE AND HAVE LISTENED TO THE THINGS THAT WE HAVE TALKED ABOUT THIS AFTERNOON, FOR YOUR BENEFIT, IF THERE'S QUESTIONS THAT YOU NEED TO ASK ABOUT OUR PROCESS ALONG THE WAY AND WHY WE'RE DOING THIS HERE AND WHAT THIS SITE'S ABOUT OR WHAT WE DO AT CAMP LEJEUNE AS PART OF OUR PARTNERING TEAM, FEEL FREE TO ASK. I'M SURE PATRICK WILL FILL YOU IN ALONG THE WAY SOMEDAY ON A LONG DRIVE SOMEWHERE, BUT I'LL START SOME OF THIS.

MS. LANDMAN: INTRODUCE YOURSELF FOR THE RECORD.

MR. BARTMAN: I'M SORRY?

MS. LANDMAN: INTRODUCE YOURSELF FOR THE RECORD.

MR. BARTMAN: I -- I ALREADY DID THAT. WE'RE GOING TO TALK ABOUT OPERABLE UNIT EIGHT, SITE 16, ONE OF THE FEW OPERABLE UNITS WHERE WE ONLY HAVE ONE SITE. I GUESS WHAT I'D LIKE TO DO IS, ON THE FACT SHEET THIS PICTURE DOESN'T SHOW UP VERY WELL, BUT ON THE FACT SHEET YOU CAN SEE THAT THIS OPERABLE UNIT IS RIGHT ON THE BORDER. IT BORDERS NORTHEAST CREEK WHICH RUNS INTO THE NEW RIVER. SO WE'RE RIGHT ON A WATER BODY. IN FACT, THIS SITE'S ABOUT 400 FEET FROM A MAIN SURFACE WATER BODY.

I'M JUST GOING TO FLIP THROUGH SOME OF THESE SITES AND NOT TALK ABOUT ALL THE DETAILS, BUT JUST TO SHOW YOU PICTURES OF THE SITE.

THIS IS THE ENTRANCE TO THE BURN DUMP, THE FORMER BURN DUMP. CURRENTLY THIS AREA IS USED AS A TRAINING AREA. IT'S IN THE CAMP JOHNSON AREA. AND IT'S USED FOR THE TRAINING OF VEHICLE DRIVERS, STUDENT DRIVERS. CAMP JOHNSON ITSELF IS A HUGE TRAINING AREA WHERE THEY TRAIN THE CHEFS. I'M NOT SURE WHAT ELSE THEY -- WHAT OTHER TYPE OF TRAINING THEY DO THERE. BUT THERE ARE BARRACKS. THERE'S NO RESIDENTIAL HOUSING OR ANYTHING THERE.

SO, WHEN WE DID THE RISK ASSESSMENT, WE LOOKED AT FUTURE RESIDENTIAL SCENARIOS. BUT IT'S UNLIKELY IN THIS AREA.

AS YOU CAN SEE FROM THE PICTURES ON THE BACK TABLE, AND ALSO FROM THIS, THERE'S A MOCK-UP JET IN THE MIDDLE OF WHAT'S NOW A VEHICLE PARK AND TRAINING AREA. BUT WHAT THEY DO IS THEY BRING VEHICLES, THE BIG TRAINING VEHICLES IN HERE, AND PRACTICE HOOKING THEM UP TO THE JET AND REFUELING AIRCRAFT, AND THEY ALSO DO TYPES OF, LIKE, PRACTICE MAINTENANCE ON THESE VEHICLES HERE AND DIFFERENT THINGS. BUT NO FUEL IS ACTUALLY USED IN THE OPERATION. THEY JUST PUMP WATER OR JUST HOOK UP THE HOSES WITHOUT ANY WATER ITSELF.

THIS IS A SURFACE WATER RUNOFF AREA IN THE SOUTHEASTERN PORTION OF THE SITE WHICH LEADS TO NORTHEAST CREEK.

THIS IS THE SOUTHEASTERN PORTION OF THAT SITE RIGHT

AFTER THAT SURFACE WATER RUNOFF AREA THAT YOU CAN SEE NORTHEAST CREEK IN THE FOREGROUND. IT DOESN'T LOOK MUCH LIKE A CREEK. IT LOOKS MORE LIKE THE NEW RIVER WHEN YOU'RE ACTUALLY THERE. IT'S A PRETTY BIG SURFACE WATER BODY.

WE CONDUCTED A FIELD PROGRAM OUT HERE IN MID-1994. THAT'S WHEN WE STARTED THE SURFACE WATER SEDIMENT INVESTIGATION. WE LIKE TO DO THAT IN MID-SUMMER WHEN THE SEASON'S HIGH AND FISH ARE FLOWING, THE BIOTA, AND BENEFITS AND EVERYTHING.

WE CONTINUED IN OCTOBER OF 1995 WITH THE SOIL AND GROUNDWATER INVESTIGATION. AND THEN, FINISHED IN I BELIEVE FEBRUARY OF '95 WITH A SECOND GROUNDWATER INVESTIGATION, SECOND ROUND OF GROUNDWATER SAMPLING. BUT WE DID A SITE SURVEY, SOIL INVESTIGATION, GROUNDWATER INVESTIGATION, SURFACE WATER SEDIMENT. AND FROM THAT INFORMATION CONDUCTED HUMAN HEALTH AND ECOLOGICAL RISKS.

I DON'T EVEN KNOW IF I NEED TO GO OVER NUMBERS. BUT AS YOU CAN SEE, THE SURFACE SOIL INVESTIGATION, THE SAMPLING IN RED SHOWS THE MONITORING WELLS THAT WE INSTALLED. THE BLACK SHOW THE SOIL BORINGS THAT WE CONDUCTED.

WE COVERED THE AREA OF THE BURN DUMP PRETTY EXTENSIVELY, IN BOTH SURFACE AND SUBSURFACE, AND ALSO COLLECTED SEVERAL GROUNDWATER SAMPLES. I BELIEVE WE INSTALLED SIX SHALLOW MONITORING WELLS.

ADDITIONALLY WE COLLECTED FIVE SURFACE WATER SEDIMENT SAMPLES. AND ALSO WE CONDUCTED TEST PITS. THESE TEST PIT

LOCATIONS WE DUG IN ORDER TO LOCATE POSSIBLE SUBSURFACE CONTAMINATION THAT MIGHT HAVE BEEN THERE FROM THE BURNING ACTIVITIES.

AGAIN, THE MONITORING WELL LOCATIONS.

SURFACE WATER SEDIMENT SAMPLING LOCATIONS. AGAIN, FIVE LOCATIONS, ONE SURFACE WATER SAMPLE TAKEN FROM EACH LOCATION. TWO SEDIMENT SAMPLES TAKEN FROM EACH LOCATION.

WHAT WE FOUND THERE, WE FOUND PAH'S SCATTERED THROUGHOUT THE BURN DUMP. THIS COULD HAVE BEEN DUE TO THE BURNING ACTIVITIES. IT ALSO COULD BE DUE TO THE VEHICLE TRAINING ACTIVITIES, INCOMPLETE COMBUSTION OF FUELS, BENZOPYRENE, FAIRLY COMMON PAH FOUND, NOT AT EXTREMELY HIGH LEVELS; FOUND AT SOIL BORING 16, WHICH WAS IN THE SOUTHERN PORTION OF THE SITE, RIGHT AT THE PERIMETER OF THE SITE.

AS IS THE CASE WITH CAMP LEJEUNE, WE FOUND SEVERAL PESTICIDES, NAMELY DDE AND DDT. CONCENTRATIONS LOOKED RELATIVELY HIGH, BUT RIGHT AROUND WHAT WE WOULD NORMALLY FIND AT CAMP LEJEUNE. AND AGAIN, THIS MAXIMUM CONCENTRATION WAS FOUND AT SBO5; IT WOULD BE IN THE NORTHERN PORTION OF THE SITE RIGHT ABOVE THE JET AIRCRAFT.

WE ALSO FOUND EVIDENCE OF PCB'S, BOTH AT 1254 AND 1260. I GUESS, YOU KNOW, ONE OF THE EXPLANATIONS HERE IS BECAUSE OF THE OILS USED TO IGNITE THE BURNS AND EVERYTHING. AND THAT'S WHERE WE THINK THE PCB'S COME FROM. AGAIN, THEY WERE DETECTED WIDESPREAD, NOT ANY IN CENTRAL LOCATION AROUND THE BURN

DUMP, AND THIS COULD BE A SCATTERIZATION -- OR THE SCATTERING OF THE SAMPLES COULD BE DUE TO THE FACT THAT THE SOILS AT THE BURN DUMP WERE MOVED AROUND, AND ALSO THE TRAINING ACTIVITIES THAT ARE NOW BEING CONDUCTED MAY HAVE RELOCATED THE SOILS.

IN THE SUBSURFACE WE HAVE, AGAIN, THE PAH'S BEING DETECTED. HOWEVER, THIS TIME WE HAVE PHENANTHRENE AND NOT THE BENZOPYRENE. AND YOU REALLY DON'T EXPECT PAH'S TO BE FOUND IN THE SUBSURFACE TOO OFTEN. AND AGAIN, WE HAVE PESTICIDES, HOWEVER DETECTED NOT AS FREQUENTLY THIS TIME, AND MAINLY IN THE SURFACE DRAINAGE AREA. THAT'S THE AREA THAT LEADS OFF TO THE NORTHEAST CREEK. AND A LOT OF THAT COULD BE DUE TO HEAVY RUNOFF IN THAT AREA AND THE PESTICIDES DRAINING INTO THAT AREA.

AGAIN, WE FOUND THE PCB'S BUT ONLY 1254 THIS TIME, AND ONLY IN TWO SUBSURFACE SOIL SAMPLES. AND AS I EXPLAINED BEFORE, WE HAVE DONE SEVERAL BACKGROUND SOILS, BOTH SURFACE AND SUBSURFACE IN THIS AREA, FOR INORGANICS. WE'VE DONE COMPARISONS, AND WE'RE WITHIN ONE ORDER OF MAGNITUDE FOR THE INORGANICS IN THIS AREA.

ONE OF THE CONCERNS WE'VE UNCOVERED THIS AFTERNOON IS THIS BENZENE WAS DETECTED IN ONE OF OUR MONITORING WELLS IN THE FIRST ROUND OF SAMPLING. THE STATE OF NORTH CAROLINA HAS ASKED US TO GO OUT AND RECONFIRM THIS. WE DIDN'T DETECT IT IN THE SECOND ROUND, BUT, BECAUSE WE ONLY HAVE TWO ROUNDS OF SAMPLING, WE DECIDED MAYBE WE SHOULD GO OUT AND TAKE A THIRD, THIRD ROUND FOR VOLATILE SAMPLES. SO, THAT'S WHAT WE'RE DOING.

PHENOL WAS ALSO DETECTED. IT'S A HIGHLY WATER-SOLUBLE COMPOUND. AGAIN, MAXIMUM CONCENTRATION WAS FOUR MICROGRAM PER LITER, WELL BELOW THE STATE STANDARDS.

AS YOU WOULD THINK, PESTICIDES, PCB'S NOT DETECTED, ALTHOUGH THEY'RE IN THE SURFACE AND SUBSURFACE. ONE OF THE CONCERNS, AGAIN, WITH THE STATE THAT THEY POSE THIS AFTERNOON IS THAT WE DO SOME TYPE OF LEACHATE MODEL TO SEE THAT THESE CONTAMINANTS WOULD BE PROTECTED WITH GROUNDWATER. THE CONCENTRATIONS THAT WERE DETECTED IN THE SURFACE AND SUBSURFACE WOULD ALWAYS BE PROTECTED WITH GROUNDWATER. SO, THOSE ARE ONE OF THE THINGS THAT WE'LL BE PREPARING AND PRESENTING IN OUR ROD.

ONE OF THE THINGS I THINK I EXPLAINED, ROUND TWO, VOLATILE PESTICIDES AND PCB'S WERE AGAIN NOT DETECTED. BUT AGAIN, BECAUSE THE VOLATILES WEREN'T DETECTED IN ROUND TWO --

(THERE WAS A BRIEF INTERRUPTION.)

MR. BARTMAN: WE'RE GOING TO GO BACK AND DO THAT THIRD ROUND OF SAMPLING PROBABLY WITHIN THE WEEK.

NAPHTHALENE DETECTED IN SIX WELLS BUT BELOW STANDARDS, 21 MICROGRAMS PER LITER.

IRON EXCEEDED BOTH THE FEDERAL AND STATE STANDARDS, BUT THE FEDERAL STANDARD IS A SECONDARY STANDARD. WHY IT'S A PRIMARY STANDARD FOR THE STATE I'M NOT QUITE SURE. I GUESS 'CAUSE YOU DON'T HAVE SECONDARY STANDARDS IN THIS STATE.

INTERESTING THAT WE FOUND 1,1,2,2-TETRACHLOROETHANE IN ONE SURFACE WATER SAMPLE AT A CONCENTRATION OF 2 PPB, ABOVE THE

FEDERAL CRITERIA. UNRELATED TO THIS SITE, NOT FOUND IN ANY GROUNDWATER. POSSIBLY AN ANOMALY.

IN THIS CASE, SEMI-VOLATILES, PESTICIDES AND PCB'S WEREN'T DETECTED IN OUR SURFACE WATER SAMPLES AS YOU WOULD HOPEFULLY EXPECT.

ARSENIC IS THE ONLY METAL DETECTED ABOVE FEDERAL CRITERIA, FEDERAL CRITERIA BEING THE AMBIENT WATER QUALITY CRITERIA. OUR CONCENTRATIONS ARE 2.2 TO 3.1.

AS FAR AS SEDIMENT, WE USED THE NOAH CRITERIA TO EXAMINE THE LEVELS THAT WERE DETECTED, AND LOW LEVELS OF VOLATILE CARBON DISULFIDE AND TOLUENE WERE DETECTED. IT'S USUALLY THE CASE THAT THESE ARE USUALLY COMMON LAB CONTAMINANTS FOUND. UNFORTUNATELY OUR QUAPC SAMPLES DID NOT ENABLE US TO WRITE THIS OFF. SO, WE HAD TO RETAIN IT FOR RISK PURPOSES AND FOR EVALUATION PURPOSES.

THERE WERE NO SEMIVOLATILE ORGANIC CONTAMINANTS, PESTICIDES/PCB'S DETECTED IN THE SEDIMENT. AND SILVER WAS THE ONLY ONE DETECTED ABOVE ANY SEDIMENT CRITERIA.

AS FOR HUMAN HEALTH RISKS, WE EVALUATED ALL RECEPTORS, BOTH FUTURE -- I SHOULD SAY BOTH CURRENT AND FUTURE RECEPTORS. IT'S ONE OF THE GUIDELINES OF THE EPA TO KNOW THE BASE MASTER PLAN MAY SAY THAT THERE WILL BE NO FUTURE RESIDENTIAL AREAS. WE STILL HAVE TO EVALUATE THOSE.

SO WE LOOKED AT ALL RECEPTORS, WE LOOKED AT ALL MEDIAS AND COMBINED THE RISKS FROM GROUNDWATER, SOIL, AND SURFACE WATER

SEDIMENT EXPOSURES. AND THE ONLY THING THAT WE CAME UP WITH AN UNACCEPTABLE RISK WAS TO FUTURE RESIDENTIAL CHILDREN FROM A NON-CARCINOGENIC RISK DRIVEN BY PCB 1254.

SO, THIS IS, I FEEL, A CONSERVATIVE RISK BECAUSE IT IS A NON-CARCINOGENIC RISK, AND IT IS TO FUTURE RESIDENTIAL CHILDREN.

FROM THE ECOLOGICAL STANDPOINT, WE LOOKED AT FLORA AND FAUNA AND TERRESTRIAL SPECIES INDIGENOUS TO THE AREA. SO WE LOOKED AT DEER, FOX, RACCOON AND QUAIL, AND THERE APPEAR TO BE NO ECOLOGICAL RISKS TO THESE SPECIES.

SO, WHAT WE PROPOSED FOR THIS SITE WAS NO FURTHER ACTION. BUT WE DO, I GUESS, AS OF TODAY WE DO HAVE A LITTLE BIT OF ADDITIONAL ACTION, AND THAT WOULD BE TO RESAMPLE THAT ONE WELL THAT HAS -- THAT HIT A BENZENE IN THE FIRST ROUND, AND ALSO TO COME UP WITH SOME CALCULATIONS IN PROTECTING THE GROUNDWATER.

SO, THAT'S ABOUT ALL WE'RE GOING TO BE DOING. AND HOPEFULLY THIS SITE WILL BE TAKEN CARE OF.

MR. NICHOLSON: YOU MAY HAVE SAID THIS, BUT I MISSED IT, HOW LONG HAS THE SITE BEEN THERE?

MR. BARTMAN: I'M SORRY. THE SITE WAS OPERATED -- THERE'S REALLY LIMITED INFORMATION ABOUT THE BURN DUMP -- FROM 1958, AND WE BELIEVE IT WAS CLOSED IN 1972.

MR. NICHOLSON: AND IS THERE -- WAS ANYTHING UNCOVERED IN THE TEST PIT?

MR. BARTMAN: NO.

MR. NICHOLSON: IS THERE ANY INDICATION THAT A LOT OF SOIL HAS BEEN MOVED AROUND ON THIS SITE?

MR. BARTMAN: YES, YOU COULD GO OUT THERE TODAY AND FIND REMNANTS OF THE BURN DUMP, SO WE HAD SOIL SAMPLES AROUND THE PERIMETER OF THE BURN DUMP. IN FACT, WE HAD ONE SAMPLE WHERE WE HAD HIGH LEAD, AND IT WAS RECOMMENDED THAT WE GO OUT AND RESAMPLE THAT PARTICULAR AREA TO CONFIRM WHETHER IT WAS AN ANOMALY, ONE SPIKE, OR WHETHER WE HAD AN AREA OF CONCERN. AND IT WAS CONFIRMED THAT WE DIDN'T HAVE A CONCERNED AREA.

MR. NICHOLSON: IS THERE ANY INDICATION THAT THERE'S BEEN SOIL MOVED AROUND AT DEPTH? I WAS JUST INTERESTED IN, YOU KNOW, YOU WERE FINDING STUFF FIVE AND SIX FEET DEEP.

MR. BARTMAN: NO, WE HAVE NO INDICATION. LIKE I SAID, WE DID FIVE TEST PITS. I BELIEVE THEY WERE 20 FEET IN LENGTH, 10 FOOT IN DEPTH AND THREE FOOT WIDE. AND THOSE TEST PITS WERE COMPLETED IN AREAS WHERE OUR SOIL BORINGS -- DURING OUR SOIL BORING EXCAVATION THAT THEY CAME UP EITHER WITH SOME TYPE OF BRIGHT OR BLACKENED DIRT OR STAINED DIRT. SO, WE CENTRALIZED OUR TEST PITS IN THOSE AREAS.

USUALLY THE BURNING ACTIVITIES CONDUCTED AT THE BASE WERE JUST ON THE SURFACE AND THIS MATERIAL WAS SCRAPED TO THE SIDE AND NOT BURIED. AND WE HAVE ANOTHER BURN DUMP THAT WE HAVE JUST PERFORMED AN INVESTIGATION ON WITH SIMILAR PRACTICES.

THERE WAS A REPORTED ASBESTOS REMOVAL COMPLETED IN THE EARLY '80S, I BELIEVE. I THINK IT WAS 100 CUBIC YARDS OF

ASBESTOS, OR FEET.

MR. MORRIS: FEET, I THINK.

MR. BARTMAN: YEAH. OF ASBESTOS. AND THERE'S NOT ANY RECORDS OF WHERE IT WAS REMOVED TO, BUT IT WAS REMOVED FROM THE SITE, FROM THE SURFACE OF THIS SITE.

HAVE WE FOUND -- I GUESS IF WE FIND CONTAMINATION IN THE SHALLOW GROUNDWATER, THEN WE'LL HAVE TO REASSESS WHAT WE NEED TO DO HERE.

QUESTIONS, COMMENTS?

MR. MORRIS: YOUR HIT OF 1,1,2,2 PCA, WHERE WAS THAT IN THE --

MR. BARTMAN: (INTERPOSING.) THAT WAS IN THE UP GRADED SAND.

MR. MORRIS: OKAY. BUT WHERE THE CREW HAS GONE UP?

MR. BARTMAN: YEAH. THERE WAS NOT SITE GRADING OR DOWNGRADING AT THE SITE. IT WAS UPGRADED.

MS. TOWNSEND: IT'S A POSSIBLE SITE OF GRADING UP THERE? DO WE HAVE ALL THE UPGRADING?

MR. BARTMAN: SITE SEVEN IS UPGRADED.

MS. TOWNSEND: SITE SEVEN?

MR. MORRIS: THERE'S A VEHICLE WASH AREA THAT'S A LITTLE WAYS UP FROM THERE WHICH IS STILL QUITE A WAYS DOWN FROM SITE SEVEN. SO, SOMETHING MIGHT BE COMING FROM THERE.

MR. BARTMAN: ANYTHING OF THAT

CONCENTRATION WE FIND IN NORTHEAST CREEK, AND THAT'S HIGHLY, I WOULD SAY, I THINK, TURBULENT, THAT'S A TURBULENT AREA, LOT OF WATER INFLUENCE.

MR. PAUL: VERY TIDAL.

MR. BARTMAN: VERY TIDAL.

MR. DUNN: YOU GO IN ABOUT TWO FEET, DON'T YOU?

MR. LOUGHMILLER: I'D SAY ONE TO ONE AND A HALF FEET IN THAT AREA.

MR. DUNN: YOU KNOW, THERE'S ABOUT TWO OF THEM CLOSE TO THE GROUND.

MR. BARTMAN: THIS IS ONE OF THE FEW SITES WE'VE BEEN ABLE TO GO NO ACTION. I CAN ONLY THINK OF ONE OTHER SITE THAT WE'VE GONE NO ACTION BEFORE. MOST SITES ARE EITHER DOING INCIDENT CONTROLS THROUGH LONG-TERM MONITORING. NOW WE'VE GOTTEN INTO RECLASSIFICATION OF THE GROUNDWATER, SHIFTED USE OF GROUNDWATER OR SOME TYPE OF REMEDIATION ALTERNATIVE. SO WE'RE DOING OUR HOMEWORK. AND LIKE I SAID, ON ONE OF THOSE LONG TRIPS WITH PATRICK, HE COULD FILL YOU IN ON EVERY ONE OF THOSE SITES, AND WHERE WE'VE GONE TO AND WHAT WORK WE'VE DONE. THIS IS NOT THE NORM. WE'RE USUALLY DOING SOME TYPE OF REMEDIAL ALTERNATIVE.

MR. PAUL: ANYTHING ELSE?

MR. LOUGHMILLER: I WAS WONDERING HOW YOU GET THE FISH FLOWING IN THE SUMMER TIME.

MR. BARTMAN: DID I SAY THE FISH FLOWING?

MR. LOUGHMILLER: YEAH.

MR. BARTMAN: FISH SWIMMING.

(WHEREUPON, THESE PROCEEDINGS CONCLUDED AT 7:34 P.M.)

STATE OF NORTH CAROLINA

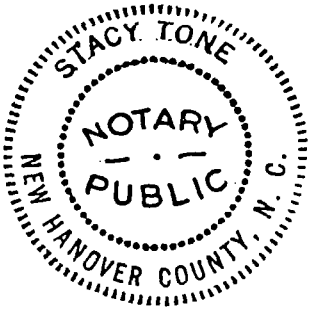
COUNTY OF NEW HANOVER

C E R T I F I C A T E

I, STACY TONE, CCR, NOTARY PUBLIC, DO HEREBY CERTIFY THAT THE FOREGOING PUBLIC HEARING WAS TAKEN BY ME AND TRANSCRIBED UNDER MY DIRECTION; AND THAT THE FOREGOING 13 PAGES CONSTITUTE A TRUE AND CORRECT TRANSCRIPT OF SAID PROCEEDINGS.

I DO FURTHER CERTIFY THAT I AM NOT COUNSEL FOR, OR IN THE EMPLOYMENT OF ANY OF THE PARTIES TO THIS ACTION, NOR AM I INTERESTED IN THE RESULTS OF THIS ACTION.

IN WITNESS WHEREOF, I HAVE HEREUNTO SET MY HAND THIS 19TH DAY OF MARCH 1996.



STACY TONE, CCR
NOTARY PUBLIC FOR THE STATE OF
NORTH CAROLINA

MY COMMISSION EXPIRES: SEPTEMBER 13, 2000

TABLE 1 (Continued)

SUMMARY OF SITE CONTAMINATION
OPERABLE UNIT NO. 8 (SITE 16)
RECORD OF DECISION, CTO-0274
MCB, CAMP LEJEUNE, NORTH CAROLINA

Media	Fraction	Contaminant	Comparison Criteria	Comparison Criteria	Site Contamination					
					Min.	Max.	Detection Frequency	No. of Detections Above Comparison Criteria	No. of Dectections Above Comparison Criteria	Locaion/Distribution Around Site 16
			SSL (µg/kg)		(µg/kg)	(µg/kg)				
Sub-surface Soils	Volatile Organic Compounds	Bromomethane	100	NE	1J	1J	1/32	NA	0	Northern
		Acetone	8,000	NE	42J	900J	12/32	NA	0	8 exceed 10x maximum blank concentrtion
	Semivolatile Organic Compounds	1,4-Dichlorobenzene	1,000	NE	50J	67J	2/32	NA	0	Northeast
		1,2,4-Trichlorobenzene	2,000	NE	45J	66J	2/32	NA	0	Northeast
		Naphthalene	30,000	NE	88J	88J	1/32	NA	0	Central
		2-Methylnaphthalene	30,000	NE	77J	77J	1/32	NA	0	Central
		Acenaphthene	200,000	NE	51J	290J	3/32	NA	0	Central to Northeast
		Dibenzofuran	120,000	NE	310J	310J	1/32	NA	0	Central
		Fluorene	160,000	NE	680	680	1/32	NA	0	Central
		Pentachlorophenol	200	NE	38NJ	94J	3/32	NA	0	Northwest and Northeast
		Phenanthrene	NE	NE	2,200	2,200	1/32	NA	NA	Central
		Anthracene	430,000	NE	380	380	1/32	NA	0	Central
		Carbazole	NE	NE	180J	180J	1/32	NA	NA	Central
		di-n-butyl-phthalate	NE	NE	270J	270J	1/32	NA	NA	Central
		Fluoranthene	980,000	NE	1,200	1,200	1/32	NA	0	Central
		Pyrene	NE	NE	670J	670J	1/32	NA	NA	Central
		Benzo(a)anthracene	700	NE	160J	160J	1/32	NA	0	Central
		Chrysene	1,000	NE	160J	160J	1/32	NA	0	Central
		bis(2-Ethylhexyl)phthalate	11,000	NE	58J	71J	2/32	NA	0	Central to Southwest
		di-n-octyl-phthalate	NE	NE	46J	46J	1/32	NA	NA	Central
		Bebzo(b)fluoranthene	4,000	NE	57J	57J	1/32	NA	0	Central

TABLE 1 (Continued)

SUMMARY OF SITE CONTAMINATION
OPERABLE UNIT NO. 8 (SITE 16)
RECORD OF DECISION, CTO-0274
MCB, CAMP LEJEUNE, NORTH CAROLINA

Media	Fraction	Contaminant	Comparison Criteria	Comparison Criteria	Site Contamination					
					Min.	Max.	Detection Frequency	No. of Detections Above Comparison Criteria	No. of Dectections Above Comparison Criteria	Locaion/Distribution Around Site 16
Sub-surface Soils (Cont.)	Semivolatile Organic Compounds (Cont.)		SSL (µg/kg)		(µg/kg)	(µg/kg)				
		Benzo(k)fluoranthene	4,000	NE	58J	58J	1/32	NA	0	Central
		Benzo(a)pyrene	4,000	NE	38J	38J	1/32	NA	0	Central
	Pesticides/ PCBs	4,4'-DDE	500	NE	7.6	36	3/32	NA	0	Northwest
		Endosulfan II	3,000	NE	7.1J	7.1J	1/32	NA	0	Surface Drainage Area
		4,4-DDD	700	NE	52J	52J	1/32	NA	0	Northwest
		4,4'-DDT	1,000	NE	37J	630	2/32	NA	0	Northwest and Surface Drainage Area
		alpha-chlordane	2,000	NE	3.8	3.8	1/32	NA	0	Surface Drainage Area
		gamma-chlordane	2,000	NE	2.4J	2.5J	2/32	NA	0	Surface Drainage Area
		Aroclor-1254	NE	NE	40	45	2/32	NA	NA	Northwest and Surface Drainage Area

TABLE 1 (Continued)

SUMMARY OF SITE CONTAMINATION
OPERABLE UNIT NO. 8 (SITE 16)
RECORD OF DECISION, CTO-0274
MCB, CAMP LEJEUNE, NORTH CAROLINA

Media	Fraction	Contaminant	Comparison Criteria	Comparison Criteria	Site Contamination					
					Min.	Max.	Detection Frequency	No. of Detections Above Comparison Criteria	No. of Dectections Above Comparison Criteria	Locaion/Distribution Around Site 16
			MCL (µg/L)	NCWQS (µg/L)	(µg/L)	(µg/L)		MCL	NCWQS	
Ground-water Round 1	Volatile Organic Compounds	Benzene	5.0	1.0	37	37	1/6	1	1	Central
		Ethylbenzene	700	29	1J	1J	1/6	0	0	--
	Semivolatile Organic Compounds	bis(2-Ethylhexyl)phthalate	6.0	3.0	1J	5J	4/6	0	1	East/Southeast of Burn Dump
		Naphthalene	NE	21	ND	6J	1/6	0	0	--
		Phenol	NE	300	ND	4J	3/6	0	0	--
	Inorganics	Barium	2,000	2,000	24.4J	77.9	6/6	0	0	--
		Calcium	NE	NE	370	13,400	6/6	NA	NA	--
		Iron	300[2]	300	712	712	1/6	1	1	East/Southeast of Burn Dump
		Lead	15[3]	15	3.2J	3.2J	1/6	0	0	--
		Magnesium	NE	NE	1,020	5,090	6/6	NA	NA	--
		Manganese	50[2]	50	9.8J	31.6J	4/6	0	0	--
		Sodium	NE	NE	2,480	16,400	6/6	NA	NA	--
		Zinc	5,000[2]	2,100	80.5	80.5	1/6	0	0	--
Ground-water Round 2	Semivolatile Organic Compounds	Naphthalene	NE	21	4J	5J	6/6	NA	0	Widespread
		bis(2-Ethylhexyl)phthalate	6.0	3.0	1J	5J	3/6	0	1	Scattered
	Inorganics	Aluminum	NE	NE	274	300	2/6	NA	NA	Scattered
		Barium	2,000	2,000	25J	54.1J	6/6	0	0	Widespread
		Calcium	NE	NE	728	6,540	5/6	NA	NA	Widespread
		Iron	300[2]	300	410	410	1/6	1	1	East/Southeast of Burn Dump
		Magnesium	NE	NE	1,380	3,130	6/6	NA	NA	Widespread
		Manganese	50[2]	50	11.4J	24.6J	2/6	0	0	Scattered
		Potassium	NE	NE	1,270	1,290	3/6	NA	NA	Scattered
		Sodium	NE	NE	2,240	14,500	6/6	NA	NA	Widespread

TABLE 1 (Continued)

SUMMARY OF SITE CONTAMINATION
OPERABLE UNIT NO. 8 (SITE 16)
RECORD OF DECISION, CTO-0274
MCB, CAMP LEJEUNE, NORTH CAROLINA

Media	Fraction	Contaminant	Comparison Criteria	Comparison Criteria	Site Contamination					
					Min.	Max.	Detection Frequency	No. of Detections Above Comparison Criteria	No. of Dectections Above Comparison Criteria	Locaion/Distribution Around Site 16
			AWQC (µg/L)	NCWQS (µg/L)	(µg/L)	(µg/L)		AWQC	NCWQS	
Surface Water	Volatile Organic Compounds	4-Methyl-2-pentanone	NE	NE	7J	7J	1/5	NA	NA	--
		1,1,2,2-Tetrachloroethane	0.17	10.8	2J	2J	1/5	1	0	
	Semivolatile Organic Compounds	bis(2-Ethylhexyl)phthalate	1.8	NE	10J	10J	1/5	1	NA	
	Inorganics	Aluminum	NE	NE	4,210J	12,300J	5/5	NA	NA	--
		Arsenic	0.018	NE	2.2J	3.1J	4/5	4	NA	--
		Barium	2,000	NE	22.9	30.4	5/5	0	NA	--
		Calcium	NE	NE	154,000J	173,000J	5/5	NA	NA	--
		Chromium	NE	NE	15.6	15.6	1/5	NA	NA	--
		Iron	300	NE	2,780J	6,650J	5/5	0	NA	--
		Lead	NE	NE	5.5J	13.7	5/5	NA	NA	--
		Magnesium	NE	NE	542,000	615,000	5/5	NA	NA	--
		Manganese	4	NE	17.2	24.4	5/5	5	NA	--
		Potassium	NE	NE	169,000	188,000	5/5	NA	NA	--
		Silver	NE	NE	6.4	8.9	5/5	NA	NA	--
		Sodium	NE	NE	4,240,000J	4,740,000J	5/5	NA	NA	--
		Vanadium	NE	NE	19.6	19.6	1/5	NA	NA	--

TABLE 1 (Continued)

SUMMARY OF SITE CONTAMINATION
OPERABLE UNIT NO. 8 (SITE 16)
RECORD OF DECISION, CTO-0274
MCB, CAMP LEJEUNE, NORTH CAROLINA

Media	Fraction	Contaminant	Comparison Criteria	Comparison Criteria	Site Contamination					
					Min.	Max.	Detection Frequency	No. of Detections Above Comparison Criteria	No. of Dectections Above Comparison Criteria	Locaion/Distribution Around Site 16
			NOAA ER-L (µg/kg)	NOAA ER-M (µg/kg)	(µg/kg)	(µg/kg)		NOAA ER-L	NOAA ER-M	
Sediments	Volatile Organic Compounds	Carbon Disulfide	NE	NE	2J	2J	1/10	NA	NA	--
		Toluene	NE	NE	1J	2J	2/10	NA	NA	--
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)		NOAA ER-L	NOAA ER-M	
	Inorganics	Aluminum	NE	NE	1,380J	7,460J	10/10	NA	NA	--
		Arsenic	8.2	70	0.8J	4.7J	8/10	0	0	--
		Barium	NE	NE	1.9	10.8	10/10	NA	NA	--
		Beryllium	NE	NE	0.27	0.33	4/10	NA	NA	--
		Calcium	NE	NE	87.4	1,220	10/10	NA	NA	--
		Chromium	81	370	3.9	21.2	10/10	0	0	--
		Cobalt	NE	NE	2.4	3.1	3/10	NA	NA	--
		Iron	NE	NE	336J	9,960J	10/10	NA	NA	--
		Lead	46.7	218	2.3J	6J	10/10	0	0	--
		Magnesium	NE	NE	504	618	3/10	NA	NA	--
		Manganese	NE	NE	1.7	10.5	10/10	NA	NA	--
		Silver	1	3.7	1.2	1.2	1/10	1	0	--
		Sodium	NE	NE	170	1,320	10/10	NA	NA	--
		Vanadium	NE	NE	3.6	29.9	10/10	NA	NA	--
		Zinc	150	410	1.9J	46.4J	10/10	0	0	--

TABLE 1 (Continued)

SUMMARY OF SITE CONTAMINATION
OPERABLE UNIT NO. 8 (SITE 16)
RECORD OF DECISION, CTO-0274
MCB, CAMP LEJEUNE, NORTH CAROLINA

(1) Detections compared to maximum base background concentration
(2) SMCL = Secondary Maximum Contaminant Level
(3) Action Level
(4) Shaded Boxes indicated detections above comparison criteria

NE = No Criteria Established
NA = Not Applicable
J - estimated value
NJ - tentatively identified compound estimated value
SSL - Region III Risk-Based Concentration Soil Screening Level Transfer Soil to Groundwater (USEPA, 1995)
MCL - maximum contaminant level
NCWQS - North Carolina Water Quality Standard
AWQC - Ambient Water Quality Criteria (Human Health; Water and Organisms)
µg/L - microgram per liter (ppb)
µg/kg - microgram per kilogram (ppb)
mg/kg - milligram per kilogram (ppm)
NOAA ER-L - National Oceanic Atmospheric Administration Effective Range-Low
NOAA ER-M - National Oceanic Atmospheric Administration Effective Range-Median
"--" = undefined

TABLE 2

CONTAMINANTS OF POTENTIAL CONCERN
EVALUATED IN THE HUMAN HEALTH RISK ASSESSMENT
OPERABLE UNIT NO. 8 (SITE 16)
RECORD OF DECISION, CTO-0274
MCB CAMP LEJEUNE, NORTH CAROLINA

Contaminant	Surface Soil	Subsurface Soil	Groundwater		Surface Water		Sediment	
Volatiles								
Carbon disulfide							X	●
Benzene			X	●				
Toluene							X	●
Ethylbenzene				●				
4-Methyl-2-pentanone					X	●		
1,1,2,2-Tetrachlorothane					X	●		
Semivolatiles								
Phenol				●				
Naphthalene				●				
Phenanthrene	X							
bis(2-Ethylhexyl)phthalate				●		●		
Benzo(a)pyrene	X							
Pesticide/PCBs								
Dieldrin	X							
Aroclor-1254	X							
Aroclor-1260	X							
Inorganics								
Aluminun						●		●
Arsenic	X					●	X	●
Barium				●	X	●		●
Beryllium	X						X	●
Calcium				●		●		●
Chromium						●		●
Cobalt								●
Iron				●		●		●
Lead	X			●		●	X	●
Magnesium				●		●		●
Manganese	X			●	X	●		●
Potassium						●		
Silver						●	X	●
Sodium				●		●		●
Vanadium					X	●	X	●
Zinc				●			X	●

Note: No COPCs were retained for subsurface soil.
X = Selected as a COPC for human health risk assessment.
● = Detected in media; compared to relevant criteria and standards; applicable to the groundwater,